

REMARKS

The following is intended as a full and complete response to the Office Action dated April 11, 2008, having a shortened statutory period for response set to expire on July 11, 2008. Claims 1-37 are pending in this application. By way of this reply, Applicants are amending claims 1, 5, 7, 9, 14, 15-17, 20, 21, 24-26, 29, 31, 32, 35, and 37, and cancelling claims 6 and 8. The Examiner rejected claims 17, 20-21, 26-28, and 31 under 35 U.S.C. § 112 as being indefinite for failing to particularly point out and distinctly claim the inventive subject matter. The Examiner objected to certain informalities in Figures 1 and 5. The Examiner objected to certain informalities in the specification. The Examiner objected to claims 5, 32, and 35 due to certain informalities. Finally, the Examiner rejected claims 1-37 under 35 U.S.C. § 103(a) as being unpatentable.

Objections to the Drawings

The Examiner objected to certain informalities in Figures 1 and 5 under 37 C.F.R. § 1.84(p)(5). The informalities in Figure 1 are presently corrected by way of an amendment to line 21 on page 3 of the specification. The informalities in Figure 5 are presently corrected by way of an amendment to line 7 on page 15 of the specification. Applicants respectfully submit that the amendments to the specification overcome the objections indicated by the Examiner and that the amendments do not introduce any new matter. For the aforementioned reasons, Applicants respectfully request that the objections to Figures 1 and 5 be withdrawn.

Objection to the Specification

The specification stands objected to due to certain informalities. Applicants submit that the amendments set forth herein have fixed those informalities. Withdrawal of the objection to the specification is therefore respectfully requested.

Objections to the Claims

The Examiner objected to certain informalities in claims 5, 32, and 35. Applicants respectfully submit that the amendments to these claims correct those

informalities and overcome the objections by the Examiner. The amendments do not introduce any new matter. For these reasons, Applicants respectfully request that the objections to the claims be withdrawn.

Rejections under Double Patenting

The Examiner provisionally rejected claims 1-14, 16, 18, 22-23, 25, and 31-35 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 2, 5, 7-8, 15, 20, 23, 27, and 30 of co-pending Application No. 10/715,370 and claims 2, 8, and 19 of co-pending Application No. 10/715,440. Applicants acknowledge the double patenting rejection made in the Office Action and respectfully request that the rejection be held in abeyance until the pending claims are in condition for allowance. At such time, an appropriate terminal disclaimer will be filed.

Rejections under 35 U.S.C. § 112

Claims 17, 20-21, 26-28, and 31 were rejected under 35 U.S.C. § 112 as being indefinite for failing to particularly point out and distinctly claim the inventive subject matter. Claim 17 has been amended to clarify an indefinite limitation. Claims 20, 21, and 26-28 have been amended to correct limitations having an insufficient antecedent basis. Applicants submit that none of the amendments introduce new matter. Lastly, the Examiner rejected claim 31 under 35 U.S.C. § 112 but offered no reason for the rejection. Based on the amendments to the claims, Applicants respectfully request withdrawal of the § 112 rejections of the claims.

Rejections under 35 U.S.C. § 103(a)

Claims 1-4, 6-15, 18-19, 22-23, 25-27, 29-31, and 34 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Van Hook (U.S. Patent No. 6,342,892 B1) in view of Bishop (non-patent document Bishop, SPARTA: Simulation of Physics on a Real-Time Architecture). Claims 5, 17, 20-21, 24, 28, 32-33, and 35-37 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Van Hook in view of Bishop and in further view of Intel (non-patent document Intel and PCI, http://www.intel.com/standards/case/case_pci.htm), Dakhil (U.S. Patent No. 6,341,318

B1), Shiell (U.S. Patent No. 6,317,820), or Telekinesys (non-patent document Havok Game Dynamics SDK, http://graphics.ethz.ch/Downloads/Seminar_Arbeiten/2002_03/Havok_Overview.pdf). These rejections are respectfully traversed.

Independent claim 1 has been amended to recite the limitations of a Physics Processing Unit (PPU) configured to provide force and collision computations on real-time physics simulation data, wherein the PPU includes (i) a PPU Control Engine (PCE) configured to control a physics simulation and to communicate with a PPU software driver executing on the Central Processing Unit, (ii) a Physics Processing Memory (PPM) coupled to the PPU, and (iii) a Data Movement Engine (DME) configured to transfer physics simulation data between the PPM and at least one PPU internal memory in response to commands received from the PCE and to initiate context switches relative to one or more other system elements. Neither Van Hook nor Bishop teaches or suggests these limitations.

Van Hook discloses a video game system having a central processing unit (CPU) and a coprocessor that handles audio and video signals through a signal processor. A standard direct memory access (DMA) module is used to facilitate data transfer between main memory and the signal processor. In his argument, the Examiner equates the DMA module in Van Hook with the claimed Data Movement Engine (DME). However, the disclosed DMA module is not the functional equivalent of the claimed DME recited in amended claim 1. The Van Hook reference makes clear that the DMA module is commanded, not by the signal processor, but by either the main processor or an execution unit (see Van Hook, col. 19, ll. 41-57). Thus, in Van Hook, the signal processor can use the data delivered by the DMA module, but it does not command the DMA module. By contrast, amended claim 1 expressly recites that the PCE commands the DME.

Further, unlike the claimed DME, the DMA module disclosed in Van Hook does not initiate context switches relative to one or more elements of the system, as recited in amended claim 1. Van Hook discloses only that the DMA module “is used to transfer data into and out of instruction memory,” (see Van Hook, col. 19, ll. 43-44).

For the foregoing reasons, Applicants submit that the DMA module of Van Hook is not the functional equivalent of the DME recited in amended claim 1.

The Examiner relies on Bishop only to demonstrate a Physics Processing Unit (PPU). Bishop discloses an application-specific integrated circuit that can accelerate physics modeling in conjunction with a CPU. Bishop is a high-level concept paper that does not disclose any of the functional details of the claimed PCE or DME recited in amended claim 1. Thus, Bishop fails to cure the deficiencies of Van Hook.

As the foregoing illustrates, the combination of Van Hook and Bishop fails to teach or suggest each and every limitation of amended claim 1. Therefore, amended claim 1 and claims 2-4, 6-15, 18-19, and 22-23, dependent thereon, are in condition for allowance.

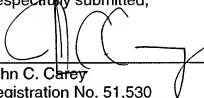
With respect to claims 5, 17, 20, 21, and 24, Intel, Dakhil, Shiell, and Telekinesys all fail to cure the deficiencies of Van Hook and Bishop set forth above with respect to amended claim 1. Therefore, no combination of the cited references can teach or suggest each and every limitation of these dependent claims. For this reason, claims 5, 17, 20, 21, and 24 are in condition for allowance.

Claims 25 and 31 are amended to recite limitations similar to claim 1 and therefore are allowable for at least the same reasons as allowable claim 1. Since claims 26-30 depend on claim 25, and claims 32-37 depend on claim 31, these claims are also in condition for allowance.

CONCLUSION

Based on the above remarks, Applicants believe that he has overcome all of the objections and rejections set forth in the Office Action mailed April 11, 2008 and that the pending claims are in condition for allowance. If the Examiner has any questions, please contact the Applicants' undersigned representative at the number provided below.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'J. Carey', is written over a horizontal line.

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